

Centerpulse Orthopedics, Ltd.

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Claims

- 5 1. An instrument system for pedicle screws (1) having an internal
thread (3) in their head (2), said thread accepting a grub screw (5)
with an external diameter D_1 in the direction of the screw axis (21)
to fixedly clamp a connection part (4) which projects transversely to
the screw axis (21) into the head, with a holder (6) with projections
10 (7) engaging in a shape matched manner at the head of the pedicle
screw and a screwdriver (10) with a diameter D_4 being able to be po-
sitioned at the grub screw (5), characterised in that at least two
holders (6a, 6b, 6c, 6d) with a tubular part (8) are provided, with the
tubular part (8) being supportable at the head (2) of the pedicle
15 screw; in that a centring part (12) insertable instead of the grub
screw (5) is present, which can likewise be screwed into the internal
thread (3), can be gripped when the holder (6a, 6d) is mounted on
and corresponds in its external diameter D to the diameter D_1 of the
grub screw (5) in order to be able to pull off the same holder (6a, 6d)
20 or other holders (6b, 6c) and to be able to guide them as often as de-
sired to shape matched mating surfaces of the pedicle screw, with
the tubular part (8) having an internal diameter D_2 which is only a
little larger than the diameter D_1 in order to position the grub screw
(5) with the screwdriver (10) or the centring part (12) guided through
25 the tubular part (8) to the head (2) of the pedicle screw such that its
threads engage with the internal thread (3) in a non-tilted manner.
2. An instrument system in accordance with claim 1, characterised in
that the internal diameter D_2 amounts to less than 1.3 times the di-
30 ameter D_1 .

3. An instrument system in accordance with claim 1, characterised in that the internal diameter D_2 amounts to less than 1.1 times the diameter D_1 .
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4. An instrument system in accordance with claim 1, characterised in that the centring part (12) has a central region (13) in the longitudinal direction which can be elastically deflected up to an angle of 20° or more away from the longitudinal axis.
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5. An instrument system in accordance with claim 1, characterised in that the centring part (12) has a lower diameter D_3 in its central region (13) in order, as a flexural spring, to allow an envisaged deflection.
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6. An instrument system in accordance with claim 4, characterised in that the centring part (12) has substantially circular cross-sections and jacket lines with gentle, stepless transitions in the longitudinal direction following the central region (13).
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7. An instrument system in accordance with claim 5, characterised in that the centring part (12) has substantially circular cross-sections and jacket lines with gentle, stepless transitions in the longitudinal direction following the central region (13).
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8. An instrument system in accordance with claim 1, characterised in that a tubular holder (6a) is formed with a centring part (12) as a positioning apparatus for pedicle screws in which the mounted holder (6a, 6d) has a fixing element (14) towards the centring part

(12) blocking in the axial direction, said centring part (12) in turn being screwed into the head (2) of the pedicle screw.

- 5 9. An instrument system in accordance with claim 8, characterised in that the mounted holder (6d) has a fixing element in the form of a clamping screw (73) which is supported at its head (72) on the holder (6d) and engages in the axial direction into an internal thread (76) at the rear part of the centring part (12).
- 10 10. An instrument system in accordance with claim 8, characterised in that the fixing element acts as a lever (11) on a transverse groove (15) of the centring element (12).
- 15 11. An instrument system in accordance with claim 1, characterised in that the tubular part (8) has as a deflection apparatus (22) for a band or cable (16) pulled through the screw head (2) a projecting shoe (17) with a deflection arc (18) and, at the other end of the tubular part (8), with respect to rotation, a shape matched coupling surface (23) for a band or cable tensioner which supports the band or

20 cable tensioner in the direction towards the pedicle screw (1).
12. An instrument system in accordance with claim 11, characterised in that the deflection arc (18) has a radius of curvature larger than 3 mm along its base (19).
- 25 13. An instrument system in accordance with claim 11, characterised in that the shoe (17) has a deflection roller (18a) instead of a deflection arc.

14. An instrument system for pedicle screws (1) having an internal thread (3) in their head (2), said thread accepting a clamping screw 5' in the direction of the screw axis (21) which can be screwed in by a screwdriver (10) with a diameter D_4' to fixedly clamp a connection part (4), which projects transversely to the screw axis (21) into the head (2), with a holder (6) with projections (7) engaging in a shape matched manner at the head of the pedicle screw, characterised in that at least two holders (66, 68) with a tubular part (8) are provided, with the tubular part (8) being supportable at the head (2); in that, in addition to the screwdriver (10), a centring piece (12) is present which can be inserted through the tubular part (8) and which can likewise be screwed into the internal thread (3), can be engaged when the holder (66, 68) is mounted and corresponds with its largest diameter D' to the diameter D_4' of the screwdriver (10) in order to be able to pull off the same holder (66) or other holders (68) and to guide them back to shape matched mating surfaces as often as desired, with the tubular part (8) having an internal diameter D_2' which is only a little larger than the diameter D_4' of the screwdriver in order to align the clamping screw (5') with the axis (62) of the screwdriver using a gripping device (59) in the screwdriver (10) and to position the clamping screw (5') at the thread (3) indirectly with the screwdriver (10) or to position a centring part guided directly through the tubular part (8) at the thread (3) or to guide a holder to a pedicle screw at a screwed in centring part (12).
15. An instrument system in accordance with claim 14, characterised in that the diameter D_2' amounts to less than 1.2 times the diameter D_4' .

16. An instrument system in accordance with claim 14, characterised in that the diameter D_2' amounts to less than 1.1 times the diameter D_4' .